



Case report

Sudden death due to massive hemoptysis secondary to pulmonary tuberculosis – A case report



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ABSTRACT

Forensic pathologists deal not only with criminal, accidental and suicidal deaths, but also with a wide range of deaths from natural causes. Natural deaths at times can be sudden, unexpected and unattended by the relatives or friends or eye witnesses. In such cases, even though there is no criminal element in their causation, the case has to be investigated and medico-legal autopsy has to be conducted to know the exact cause of death, thus putting an end to the allegations raised. A 55-year-old male was found dead lying in his room in a pool of blood without any obvious injuries under suspicious circumstances with disturbed furniture in his room. The case was investigated due to suspicious circumstances of his death and absence of history of significant medical illness. The autopsy revealed the death was due to asphyxiation as a result of massive hemoptysis secondary to fibro-cavitary tuberculosis.

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1. Introduction

One of the main causes of death due to respiratory disease is hemoptysis.¹ Hemoptysis is the coughing of blood originating from the respiratory tract below the level of the larynx. The amount of blood expectorated varies greatly from a few streaks of blood in the phlegm or blood-stained sputum to a frank hemorrhage. When it occurs for the first time it is rarely copious but it is a symptom which always causes great anxiety and rarely ignored by the patient. This is in striking contrast to other symptoms of chest disease for a patient may have had a cough for months before seeking medical advice.² The various causes of hemoptysis include tuberculosis, bronchiectasis, lung abscess and bronchogenic carcinoma. However, their prevalence is changing in different parts of the world and while tuberculosis and other suppurative lung disorders have ceased to be important causes of hemoptysis in the West, they continue to be the major causes in India.³ Tuberculosis (TB) is a potentially fatal contagious disease that can affect almost any part of the body but is mainly an infection of the lungs caused by *Mycobacterium tuberculosis*. Although TB can be treated, cured, and can be prevented by drugs, public health personnel and the government have not been able to eradicate it in developing world.

Pulmonary tuberculosis is the most important cause for massive hemoptysis (600 ml in 24 h), which results in a mortality of more than 50% cases.⁴ Majority of these cases occur in the world's poorest and developing countries, who struggle to cover the cost associated with the management and control programmes.^{5–7} Death, in most of such cases, is secondary to asphyxiation from aspiration rather than from the bleeding itself.⁸

2. Case report

A 55-year-old male was subjected for autopsy on 13-04-12 who was found dead in a pool of blood with disturbed furniture in his room. Dead body was moderately built and poorly nourished. Faint postmortem staining present over back and was fixed, Rigor mortis was appreciated all over. Dried blood stains present over and around mouth and nostrils. No demonstrable external/internal injuries were noted at autopsy. Pleurae on both sides were thickened and adherent to the chest wall at places. Pleural cavity contained 200 ml of straw colored fluid on left side. Multiple enlarged perihilar lymph nodes, greyish-white in color, varying in sizes from $2.2 \times 1.8 \times 1$ cm to $1 \times 0.6 \times 0.4$ cm were observed and upon sectioning showed caseating necrosis. Exploration of the tracheo-bronchial tree showed blood. Fig. 1. Both lungs were greyish-white and consolidated all over with multiple specks (tubercles) on the surfaces. Lungs when sectioned showed caseating necrosis with cavitation Fig. 2. Stomach contained 800 ml of dark brown colored

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altered blood, no unusual smell, mucosa was normal. Other organs were intact and pale.

Histopathological examination confirmed the fibro-cavitary tuberculosis, organizing pneumonia, pulmonary edema and emphysematous changes in both the lungs and caseating tuberculosis of hilar lymph nodes. Microscopic examination revealed that alveoli were markedly dilated and alveolar septal vessels were congested. Foci of pulmonary edema were seen. Large areas of caseation necrosis with epithelioid cell granulomas composed of epithelioid cells, lymphocytes and Langhans' giant cells were seen. Foci of organizing pneumonia with fibroblastic proliferation were seen. Alveolar destruction with replacement by mixed inflammatory cell infiltrate composed of neutrophils, lymphocytes and histiocytes were seen. Blood vessels showed fibro myxoid thickening of their walls. Lymph node architecture was completely destructed and replaced by vast areas of caseation necrosis with epithelioid cell granulomas.

3. Discussion

In the present case the person was lying in pool of blood in his living room with furniture scattered around. Injuries as a cause for external hemorrhage were ruled out at autopsy. The other causes for such frank bleeding could be hemoptysis and hematemesis. Hemoptysis or blood-spitting is a symptom of many different diseases and it should always lead to a complete investigation of the patient to determine its origin and cause. Hence hemoptysis has to be differentiated from pseudo-hemoptysis where a cough reflex is stimulated by blood not originating from the lungs or bronchial tubes but from the oral cavity or nasopharynx (eg following an epistaxis) or following aspiration of hematemesis into the lungs. In the present case intact gastro intestinal tract ruled out the possibility of hematemesis/pseudo-hemoptysis. Thus the focus was on to the presence of hemoptysis.

Cavitating tuberculosis and malignancy of lung are two major causes of sudden massive hemoptysis. Either of these may erode gradually into a local blood vessel until it gives way. This erosion is far more common with TB and relatively rare with carcinoma. Other cavitary lesions in the lungs include bronchogenic carcinoma and lung abscess. Massive hemoptysis is rare and accounts for less than 1.5% of all cases of hemoptysis.⁵

In the present case, the tracheobronchial tree was flooded with blood and even the stomach contained the altered blood suggesting that the person would have swallowed the blood after coughing it out from the tracheobronchial tree in end asphyxial stage. The



Fig. 2. Cut section of left lung showing fibro-cavitary areas and caseation necrosis.

microscopy demonstrated large areas of caseation necrosis with cavitations filled with blood. These cavitary lesions were lined by epithelioid cell granulomas composed of epithelioid cells, lymphocytes and Langhans' giant cells. Ziehl Nielsen staining identified a low number of acid and alcohol fast bacilli. Similar observation was made in a study.⁹

The pathophysiology of hemoptysis in TB may be variable including lung cavitations, residual bronchiectasis, scar carcinoma in old TB, formation of mycetoma in the tuberculous cavity and rupture of Rasmussen's aneurysm, i.e. aneurysm of the pulmonary artery caused by the disease. Acute death due to tuberculosis is a consequence of the erosion of a fully patent vessel located in the wall of a cavity. Hemoptysis however, may result from rupture of a dilated vessel in a cavity (Rasmussen's aneurysm) or from aspergilloma formation in an old tuberculous cavity.¹⁰ The hilar lymph nodes were enlarged and showed caseous necrosis, as the most common extrapulmonary manifestation (up to 50% of extrapulmonary TB) is tuberculous lymphadenitis. Tuberculous hilar lymph nodes have been described as the cause of tracheopulmonary artery fistula leading to death from exsanguinations.¹¹

Death can result either from hemorrhagic shock or due to suffocation and asphyxiation due to flooding of the tracheobronchial tree. In the present case there was evidence of massive hemoptysis even though it was not possible to identify the exact site of bleed. It's most likely that the person would have died of suffocation and asphyxiation rather than hemorrhagic shock. Hence the cause of death was opined to be due to "asphyxia as a result of hemoptysis secondary to fibrocavitary tuberculosis" (Natural Death).

Management strategies of such cases includes prevention of asphyxiation, localization of site of bleeding, arresting the hemorrhage, determining the cause of the hemorrhage and to treating the patient definitively (with surgery if required). In TB-related hemoptysis, thoracotomy with double-lumen endotracheal intubation and resection of the cavity may be curative and life-saving.¹¹

4. Conclusion

In a developing country like India where Tuberculosis is endemic, it's imperative for all medical and nursing professionals to be aware of the possibility of life-threatening hemorrhage in apparently healthy patients with TB, the possibility of recurrence and of the high mortality associated. Death can be prevented in such patients if urgently investigated, monitored and treated in a high-dependency setting.



Fig. 1. Exploration of blood filled tracheo-bronchial tree.

Ethical approval

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Conflict of interest

None.

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